

## **CLAIMS:**

1. An electronic monitoring device for archiving chemical exposures of a consumable part inside a semiconductor processing tool, comprising:

a memory unit dedicated to the consumable part and configured to store a history of said chemical exposures of said consumable part;

a processor connected to the memory unit and configured to communicate with said memory unit to store said history; and

a power supply circuit connected to the memory unit and the processor, and configured to transfer power to the memory unit and the processor.

2. The device of Claim 1, further comprising:

a gas sensor configured to sense a gaseous environment that the consumable part is exposed to.

3. The device of Claim 1, further comprising:

a chip package including said memory unit, said power supply circuit, and said processor; and

said chip package attached to said consumable part.

4. The device of Claim 1, further comprising:

a chip package including said memory unit, said power supply circuit, and said processor; and

said chip package embedded in said consumable part.

5. The device of Claim 1, further comprising:

a chip package including said memory unit, said power supply circuit, and said processor; and

said chip package detached from said consumable part.

6. The device of Claim 1, further comprising:

a chip package including said memory unit, said power supply circuit, and said processor; and

said chip package disposed outside the semiconductor processing tool.

7. The device of Claim 1, wherein said chip package includes an identification number associated with the consumable part.

8. The device of Claim 1, wherein said processor is configured to wirelessly communicate data from and to the memory unit of the electronic monitoring device.

9. The device of Claim 1, wherein said processor is configured to communicate said history upon password confirmation.

10. The device of Claim 1, wherein said processor is configured to communicate with a semiconductor processing tool controller, to download semiconductor processing data from the semiconductor processing tool controller, and to store selected parts of said semiconductor processing data in the memory unit as said history of said chemical exposures of said consumable part.

11. The device of Claim 10, wherein said processor is configured to communicate as said semiconductor processing data at least one of process run data and gas sensor data.

12. The device of Claim 1, wherein said memory unit comprises a non-volatile memory.

13. The device of Claim 1, further comprising:  
a battery configured to supply power to said power supply circuit for operation of said memory unit and said processor.

14. The device of Claim 13, wherein said battery comprises a rechargeable battery.

15. The device of Claim 14, further comprising:  
an rf antenna configured to receive rf energy from an rf field within the semiconductor plasma processing tool;  
a power converter configured to convert said rf energy into dc power; and  
said rechargeable battery configured to be recharged from said dc power.

16. The device of Claim 1, further comprising:

an rf antenna configured to receive rf energy from an rf field within the semiconductor plasma processing tool;

a power converter configured to convert said rf energy into dc power for operation of said memory and said processor

17. The device of Claim 1, further comprising:

a connection port connected to at least one of said processor, said power supply circuit, and said memory unit.

18. The device of Claim 17, wherein said connection port is configured to supply power to said power supply circuit for operation of said memory unit and said processor.

19. The device of Claim 17, wherein said connection port is configured to communicate to said memory unit.

20. The device of Claim 1, further comprising:

a gas sensor connected to said power supply circuit, said processor, and said memory unit.

21. A method for disposing of a consumable part from a semiconductor processing tool, comprising:

acquiring data associated with chemical exposures of the consumable part while inside the semiconductor processing tool;

storing in a memory unit dedicated to the consumable part as said data a history of said chemical exposures of said consumable part;

reading said history of said chemical exposures to identify from said history toxins that the consumable part was exposed to while inside the semiconductor processing tool; and

disposing of said consumable part based on the toxins identified from said history.

22. The method of Claim 21, wherein the step of acquiring data comprises:

acquiring said data from a gas sensor configured to sense the gaseous environment about the consumable part.

23. The method of Claim 22, wherein the step of acquiring data comprises:

acquiring said data from said gas sensor attached to said consumable part.

24. The method of Claim 22, wherein the step of acquiring data comprises:  
acquiring said data from said gas sensor connected to said semiconductor processing tool.

25. The method of Claim 24, wherein the step of acquiring data comprises:  
transmitting at least one of gas sensor data and process run data from said semiconductor processing tool to said memory unit dedicated to the consumable part.

26. The method of Claim 25, wherein the step of transmitting transmits said data from said gas sensor connected to said semiconductor processing tool wirelessly to said memory unit dedicated to the consumable part.

27. The method of Claim 25, wherein the step of transmitting transmits said data from said gas sensor connected to said semiconductor processing tool by wire to said memory unit dedicated to the consumable part.

28. The method of Claim 21, wherein the step of acquiring data comprises:  
acquiring process run data from said semiconductor processing tool; and  
discriminating and removing process proprietary data from said process run data such that non-confidential data is stored as said history of said chemical exposures.

29. The method of Claim 21, wherein the step of storing said data comprises:  
storing said data in a non-volatile memory unit.

30. The method of Claim 21, wherein the step of reading said history comprises:  
reading said history from said memory unit after password confirmation.

31. The method of Claim 21, wherein the step of reading said history comprises:  
transmitting said history from said memory unit wirelessly to a recipient.

32. The method of Claim 21, wherein the step of reading said history comprises:  
transmitting said history from said memory unit by wire to a recipient.

33. The method of Claim 21, wherein the step of reading said history comprises:  
identifying exposure levels to said toxins.

34. The method of Claim 21, wherein the step of disposing of said consumable part  
comprises:

selecting a disposal technique based on a primary toxin that said consumable part was  
exposed to.